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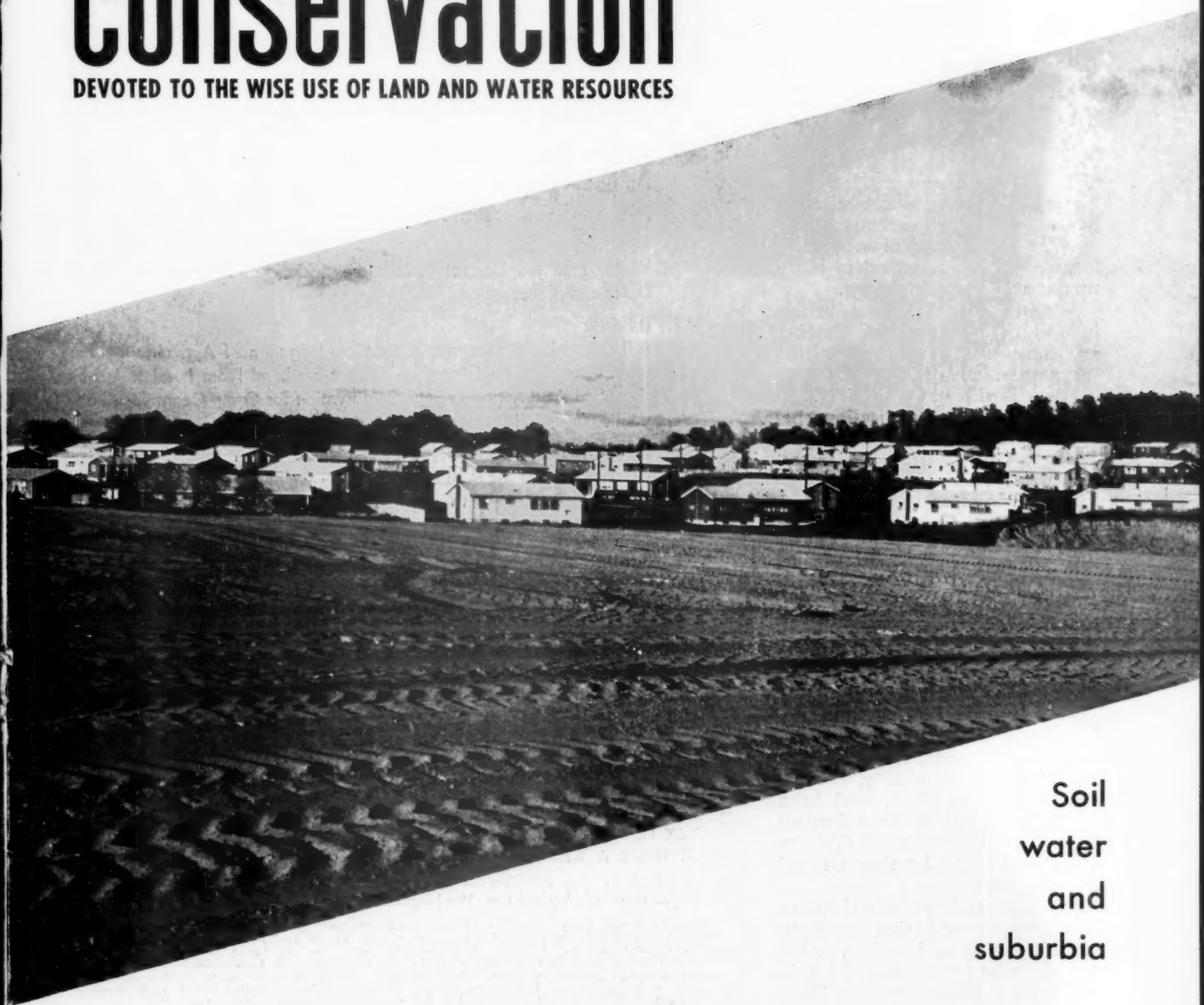
soil conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES



Soil water and suburbia

SOIL CONSERVATION SERVICE

U. S. DEPARTMENT OF AGRICULTURE

COVER: A suburban development in Connecticut illustrates the widespread exposure of soil that is common during building and reminds us that "under all is the land."

Suburban . . .

About a year ago, a national Conference on Soil, Water, and Suburbia brought into focus a growing concern with conservation problems of urbanizing areas.

SCS first identified urbanization as a conservation problem because of the large amount of productive farmland being absorbed in built-up areas and superhighways.

Administrator Williams' article in *Soil Conservation* for October 1956 was a milepost in recognizing this new land use dilemma.

His editorial (p. 47) in this issue reflects the newer realization that much land inevitably must be used for urban purposes and that soil and water technologies can serve those purposes as well as agricultural ones.

"Under all, the land": Under this title a former editor of this magazine, Tom Dale, considered (October 1957) some of the conservation problems of suburbia itself and reported the first employment by a county of a full-time soil scientist.

In this issue Stuart Finley (p. 35) describes the comprehensive program of runoff and sediment control that same county, Fairfax, Va., now has in effect. And John Quay (p. 27) tells how a suburban county on the edge of Chicago bases land use planning on soil information.

Soil surveys have official status in regulating sanitation in Pennsylvania (F. Glade Loughry, p. 31) and shoreland protection in Wisconsin (A. J. Klingelhoets, p. 33).

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DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

27 **Using the facts to find the plan**
By John R. Quay

30 **Roadbank project creates beauty and controls erosion**

31 **Soils and sanitation**
By F. Glade Loughry

33 **Zoning with soil surveys**
By A. J. Klingelhoets

35 **Soil conservation goes to town**
By Stuart Finley

39 **Yakima Indians ban gravel pits near roads**

40 **An easier way to irrigate**

42 **Farmer sweetens that lemon acre with coastal bermudagrass**

44 **Meetings**
Water Pollution Control Federation; Society of American Foresters; Dates and places

45 **Review**
Soil Dynamics in Tillage and Traction; Irrigation of Agricultural Land; Introduction to Flood Proofing; Converting Land From Rural to Urban Uses; Soil Acidity and Liming; Conservation for Camp Counselors; New publications; Soil surveys

47 **From the Administrator**
Conservation for the total community

48 **They cooperated to remove road hazard and develop water supply**

Around the country and abroad
34 Conservation newsletter, Indiana; 42 Tree planting, Algeria; 43 Music student, Oklahoma; 43 Mulch planting, Mississippi; 44 Youth projects, Florida

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Using the facts to find the plan

Illinois county officials turn to soil maps and resource data as guide to good land use

By John R. Quay

Executive secretary, McHenry County Regional Planning Commission, Woodstock, Ill.

The planner's task is one of finding the plan, as Henry McKaye said 40 years ago in his book, *The New Exploration.*

Today, the problems and methods are different but the task is the same. How does today's planner find the right plan for orderly land use in a developing suburban area?

In McHenry County, Ill., on the edge of Chicago, we believe that we can find the plan through a meaningful evaluation of our natural resources—an evaluation of the capabilities and suitabilities of the landscape for urban, agricultural, recreational, and conservation uses. We are basing this evaluation on information about the soils, geology, hydrology, and topography of the area, and other resource data.

For example, as part of this evaluation we have made a watershed map that divides the county into what we believe to be manageable watersheds. The watershed boundaries were determined not only from consideration of surface hydrology but also of the need for a common resource interest among the residents.

The Soil Conservation Service, in cooperation with the McHenry County Soil and Water Conservation District and the McHenry County Regional Planning Commission, recently provided us with a map showing all the potential reservoir sites of more than 5 acres within the county. This survey will serve as major background information for a water-management study which the commission is now undertaking.

Comprehensive resource evaluation sometimes reveals unexpected potentials for land use as well as forewarning of problems.

One area in the county is predominantly of a sandy, well-

Sod farms are making use of some of the wet bottom lands that are not suitable for row crops. Photo courtesy McHenry County Regional Planning Commission.

drained soil, considered one of the least productive for farming. But when the geologist, ground water hydrologist, soil scientist, and plant material specialist got together and all looked at the same area at the same time, they found that it overlies a large sand and gravel deposit that holds a great deal of ground water suitable for irrigation. The plant material and soil specialists indicated that with modern management techniques the area could be one of the most productive in the county.

The level topography, good internal soil drainage, abundant water supply, a nearby toll road, and a "farm" zoning classification, which in reality permits 1-acre residential use, also make the area very attractive to the subdivider and the land speculator.

But the use of this area for small-lot housing with septic tanks for waste disposal could very well contaminate the water supply for both irrigation and domestic purposes.

If our preliminary evaluation proves valid we are hopeful that we will have sufficient technical data to convince both the agricultural interests of the county and the county legislative body that it is in the public interest to restrict land uses in this area to agricultural activities.

"Our goal," says Ted Wickman, chairman of the McHenry County Regional Planning Commission, "is to effectively guide future development to obtain maximum benefits from both natural and human resources for the welfare of the present and future residents of our county."

Maps of limitations

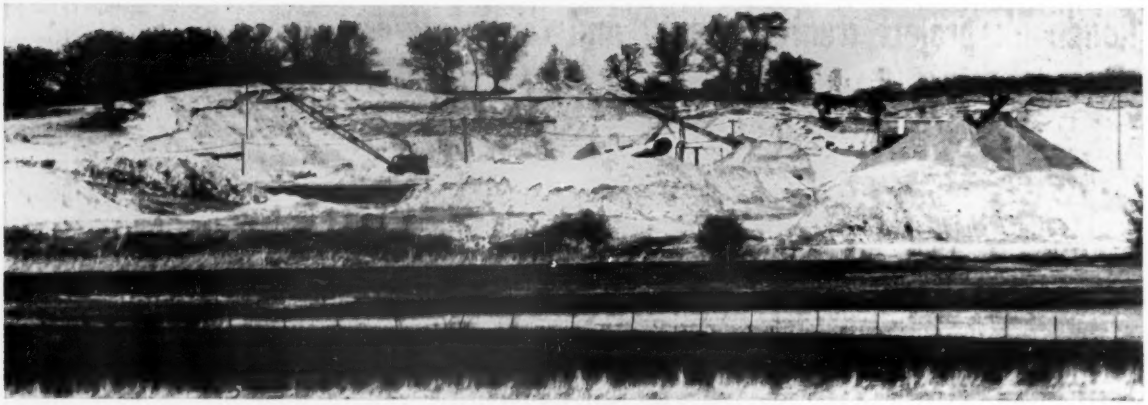
To get at this task, we are developing a series of colored maps indicating degrees of limitations for various land uses based on the capabilities of those natural resources. The McHenry County District, with assistance from SCS soil scientists, provided us with information about the soils. With these data the commission developed interpretative maps depicting soil limitations for building foundations, agricultural uses, and septic waste-disposal systems, and presence of water hazards.

One of our major problems is in translating technical information into language that is meaningful to the public. In our experience, the best way to do this is with graphic presentation. In order to standardize on a uniform, readily understood legend, we applied the universal traffic light color system. Green (as in a go sign) is used to indicate no or slight soil limitations for a potential use. Yellow (caution) indicates a moderate limitation—problems which can be economically overcome. Red (stop) shows severe limitations—not that the soil cannot be used for a specific purpose but rather that the problems inherent in it are severe and that it may not be economically feasible to overcome them for that use.

Geologic maps

We have worked also with the Illinois State Geological Survey in developing interpretative geologic maps. These maps used the same coloring system as the soil maps. Some of the geologic interpretative maps show location and quality of sand and gravel resources and areas suitable for heavy building foundations. Others indicate availability of ground-water supplies and areas of potential ground-water pollution.

Although we have not completed all the natural resource evaluations needed, the information is already being put to use. Last year, the McHenry County District working with the McHenry County Planning Commission answered more than 350 requests for consultive services from developers, realtors, public agencies, and other landowners. Most of the inquiries dealt



McHenry County produces 40 percent of the sand and gravel used in the Chicago metropolitan area. Soil maps help locate gravel deposits. Photo courtesy McHenry County Regional Planning Commission.

with the suitability of a certain tract of land for a specific type of land use.

The city planning commissions of Crystal Lake, Marengo, and Woodstock, all communities within McHenry County, are already developing their own copies of interpretative maps for use in guiding their local land use planning.

Problem of coordination

The planning job is not easy and has not been completed. Fragmentation of authority among a number of federal, state, and local agencies is one aspect of the problem. Another is the high degree of specialization of many resource experts.

Specialization often limits understanding of the total evaluation approach and the necessary working relationships that have to be established with other technical disciplines. Scheduling of coordinated assistance by several agencies is also difficult, and agency functions are often restricted to a narrow field of endeavor. Probably the root of all these problems is a lack of experience in a team approach to regional planning and land use problems.

One way to overcome some of these difficulties might be to establish a natural resource service center in each metropolitan area where one repository of skills, services, and knowledge would be staffed by personnel from a variety of federal, state, and local agencies. Such a center should be equipped to do both laboratory and field research on problems of the metropolitan area. It should also work closely with institutions of higher learning, especially in senior and graduate level programs relating to the use of natural resources.

We believe such a center would expedite the task of planning land use developments in line with the capabilities of natural resources. ♦

Another Soil, Water, and Suburbia Conference

The third of a series of state and regional conferences growing out of the national Soil, Water and Suburbia Conference in Washington, D. C., in June 1967 is scheduled in the Center for Continuing Education in Athens, Ga., November 25 and 26.

Atlanta representatives of the U. S. Department of Housing and Urban Development, under the direction of Regional Administrator Ed H. Baxter, are working with SCS State Conservationist Cecil Chapman and his staff on arrangements.

Other conferences on problems arising from the changing of agricultural land to suburban uses were held in Austin, Tex., in October 1967, and Baton Rouge, La., in February 1968. ♦

New motion picture on suburban problems

"Mud," a 23-minute documentary motion picture focusing on urban and suburban development as a source of damaging sediment, was recently released by Stuart Finley Productions, Falls Church, Va. SCS is one of the sponsors of the new film.

The idea for "Mud" had its birth in the national Soil, Water, and Suburbia Conference in Washington, D. C., June 15 and 16, 1967. The head of the firm, Stuart Finley, veteran Washington radio-television announcer and now chairman of the Northern Virginia Soil and Water Conservation District, was a conference speaker.

"Mud" is the most recent of nearly a score of films produced by the Virginia firm dealing with watershed conservation problems. The series includes "The Green City," award winner at the New York International Film Festival, "Teamwork on the Potomac," and "Crisis on the Kanawha." ♦

Roadbank project creates beauty and controls erosion

Some 3½ miles of bare, eroded road cuts and fills have been seeded on the Long Creek Road in Macon County, Tenn., as a pilot roadbank erosion control and beautification project measure with the Hull-York Lakeland Resource Conservation and Development Project.

Long Creek Road is a Federal secondary road that leads to the Macon County Golf Course and serves as a gateway to the northwestern part of the county. It is the main street to one of the growing subdivisions near Lafayette.

The Macon County Soil Conservation District sponsored the project, and the Macon County Highway Department assisted the district with labor to apply lime, fertilizer, seed, and mulch purchased with RC&D funds. Many landowners along this road contributed equipment and labor for seedbed preparation. The Soil Conservation Service supplied the technical assistance for the project measure.

Following plans for treatment, 3 acres were seeded to fescue and white clover, and 4 acres to sericea and annual lespedeza. One acre was planted to kudzu and 0.1 acre to crownvetch. Seven seeding mixtures for use in vegetating Tennessee roadbanks, recommended by the Joint SCS-University of Tennessee Plant Materials Committee, were seeded for comparison in plots along the Long Creek Road.

George W. Hauskins, chairman of the Macon District and associate RC&D director, said, "This work shows what can be done to change the unsightly roadsides in Macon County to attractive features of the landscape."

"This pilot project looks very good," Harold Cothran, road supervisor for the Macon County Highway Department, said. "It indicates what we can do toward establishing vegetation along bare roadsides in the entire county."—ARTHUR G. FUQUA, *work unit conservationist, SCS, Lafayett, Tenn.* ◆

Top, Paul Tucker (left) and Tom Page check seedbed and seed; center, Raymond Forkum seeds the roadbank; and bottom, Paul Tucker, Jess Dyer, J. C. York, and Raymond Forkum (left to right) spread mulch on the newly seeded roadbank on Long Creek Road.

Soils and sanitation

On-lot sewage disposal and sanitary landfills depend on soil as a purifying agent

By F. Glade Loughry

Soils technologist, Pennsylvania Department of Health, Harrisburg, Pa.

City dwellers move to the suburbs to escape close-crowding neighbors and to find fresh air and gracious living. Too often, they find instead that they have escaped from sanitary facilities and services that they took for granted.

When the septic system clogs up, or the well water takes on a suspicious unpleasant taste, the dream begins to fade. And when the neighbors' sewage taints the air, disillusionment is complete.

There can be still more surprises. Trash and garbage collection may not be adequate, because of cost of disposal. Or a poorly located, poorly operated disposal site can be a nuisance, producing offensive odors or smoke, breeding flies and rats, and polluting water with odorous leachate.

Sewage Facilities Act

Rapid expansion of population into formerly rural areas around cities and towns has made these problems critical in most states. Pennsylvania has found it necessary to enact new legislation to meet the environmental health problems posed by rapid urbanization.

The Pennsylvania Sewage Facilities Act of 1966 provides for the planning and regulation of community and individual sewage disposal systems. It requires municipalities to submit comprehensive plans for meeting sewerage needs in their jurisdictions. It requires permits for persons installing such systems and authorizes the Pennsylvania Department of Health to adopt rules, regulations, standards, and procedures.

The Sewage Facilities Act puts responsibility on more than 2,500 municipalities in Pennsylvania. The cities, towns, townships, and boroughs can act cooperatively or jointly in carrying out provisions of the act.

The State Department of Health is charged with enforcement of the act in municipalities that do not make provision for its application or that do not follow standards and regulations. State funds are provided for reimbursing municipalities for half the cost of local enforcement and for half the cost of official plans.

The municipal plans are being prepared by planning commissions and consultant firms. Rate of growth is the principal factor in setting dates for completion of plans. Plans are required to show:

(1) Areas where community sewage systems are now in existence.

(2) Areas where such systems are planned to be available within 10 years.

(3) Areas where community systems are not planned within 10 years.

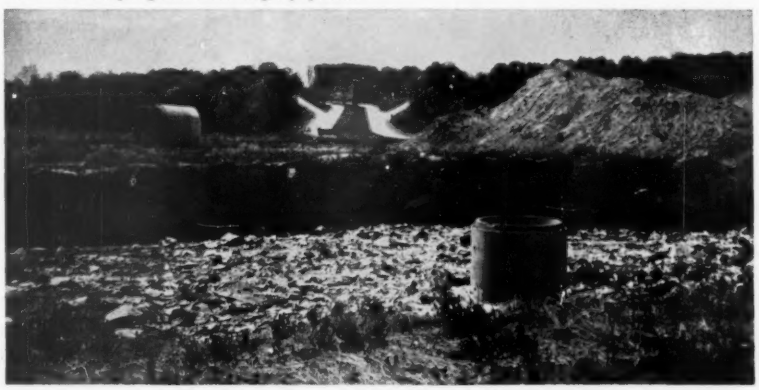
Soil survey is basis

Where public sewer systems do not exist, the plan must include an evaluation of the soils in terms of their capability for on-lot sewage disposal. This is commonly based on the detailed soil surveys made by the Soil Conservation Service. In a few critical areas where soil surveys have not been made, matching funds have been granted to municipalities to help them enter into agreements with SCS for accelerated soil surveys.

Consideration of soils is involved also in issuing permits for new individual sewage systems as required by the act for lots less than 1 acre in size. Traditionally, on-lot disposal has meant a septic tank with a tile distribution field for subsurface percolation of effluent.

Soil surveys are the first tool in screening applications for permits. Detailed information on type of soil, depth to seasonal high water table, depth to bedrock, slope, and percolation rate must be furnished. Where the soil survey is available

An experimental landfill near Kennett Square, Pa., is in Chester silt loam, a deep, well-drained soil. The culvert pipe gives access to the interior of the fill for sampling and recording equipment.



these data can be taken from it, subject to onsite checking and confirmation.

Many soils have characteristics that make them clearly unsuitable for standard subsurface sewage disposal systems. These include:

(1) A high ground-water table, (2) shallowness to impermeable rock, (3) steep unstable slopes, (4) slowly permeable subsoil, (5) flooding by stream overflow, and (6) shallowness to a very permeable layer, such as creviced limestone or coarse gravel, that does not filter and purify the effluent.

A reliable guide

The presence of soil features that indicate these conditions is usually more reliable than limited and possibly biased tests made under poorly controlled conditions. For example, the easily recognized denseness, platy structure, and mottling of a fragipan tells more about the permeability of a site than percolation tests made at shallow depths in a dry season when water can spread laterally in loose soil above the pan. Also, soil mottling indicating seasonal wetness identifies a poor site even if the inspection is made in dry weather.

Some soils that by definition are deep, well-drained, permeable, and on gentle to moderate slopes are good risks for on-lot disposal systems. The percolation rate to be used in designing the tile field for a given volume of effluent can be based on standard test data of the Pennsylvania State University Soil Characterization Laboratory.

Other soils on mixed materials vary so much within short distances that general interpretations cannot be used with confidence. They require on-lot examination to locate a safe spot for a tile field.

Alternatives to conventional septic tank and tile field systems need to be considered for some situations. One is in areas where sewers are scheduled for installation in 2, 5, or 10 years, and builders need to maintain momentum to justify eventual construction of the sewers. Another is for lots that have remained open in a developing area because of poor sites. Here the question often is: "Why is a permit denied for this lot when the neighbors have septic tanks that have never given any trouble?"

Also there is a need for temporary measures that will work for a while where sewers are definitely scheduled for early completion.

One alternative to a septic tank and filter system is an aeration tank. Such equipment does an even better job of breaking down wastes. A good system destroys 85 to 90 percent of the biodegradable material in the sewage.

An aeration system also gives a safer effluent where the tile field includes limestone with crevices or beds of clean gravel that do not filter the effluent. In this situation, a sand filter in the distribution trench spreads and slows the effluent so that it has more time in contact with the soil.

Other alternatives include pumping effluent to a point where satisfactory soil is found; filling an area with permeable soil to get sufficient soil depth above the water table or above gravel; and holding tanks. A holding tank is expensive if used for an extended period because all sewage has to be pumped to tank trucks and hauled to a sewer system where it will be accepted by a treatment plant.

Ton of wastes a year

Disposal of solid waste is another aspect of a problem that grows with changing technology and growing population. Estimates of the total annual production of solid wastes range from ¾ ton to over a ton per capita.

Sanitary landfill is an economical way of disposing solid wastes. Alternative methods are incineration, composting, and feeding garbage to hogs.

Soil is an important consideration in all of these methods. Incineration and garbage feeding reduce the volume of waste but still leave residues that have to be disposed of in landfills or on the soil. Composting yields a soil conditioner that is useful to agriculture.

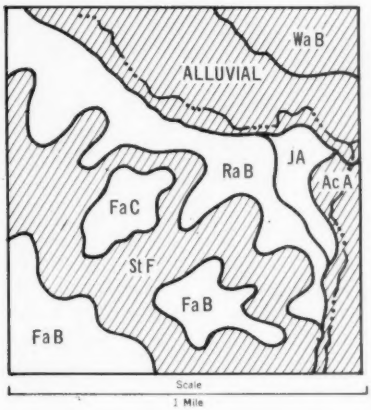
Landfilling requires careful site selection and strict control of operations to avoid raising other problems. Many people associate landfilling with dumping and react to a proposal of a nearby site by saying, "Put it somewhere else."

Aside from the emotional problem, there are real hazards to be overcome in locating and operating a sanitary landfill. Decomposing garbage, trash, and industrial wastes yield a wide range of obnoxious products. Good soil properly used has a great renovating effect on the intermediate products.

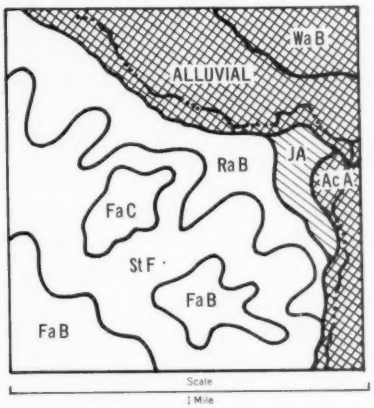
If the reaction can be kept aerobic, most of the organic matter breaks down to carbon dioxide and water. If the sanitary landfill is below the water table, methane is a principal gas product and soluble products combine with water to make a dark offensive leachate. If excess water is present, leachate breaks out of the fill to pollute surface water and ground water.

A good sanitary landfill provides for placement of the solids in a trench where they can be compacted and covered daily with at least 6 inches of soil. This prevents accidental fires, blowing of papers, propagation of flies and rats, and escape of odors. Final cover needs to be with at least 2 feet of soil.

Soil conditions that are suitable landfill sites are such that landfills are in competition for good land with agriculture, the housing industry, highways, and many recreational enterprises. The soil should be deep, well drained, medium or moderately coarse in texture, on gentle to moderate upland slopes, without many stones or boulders, never flooded by streams, and not underlain by rock that has large channels or by gravel beds that will not filter leachate. ♦



Map showing soil delineations with severe limitations for onsite soil absorption sewerage systems and for building sites.



Alluvial soils subject to flooding

High water data indicates additional areas subject to flooding

Zoning with soil surveys

Wisconsin counties use soil maps in regulating building on flood plains and shorelands

By A. J. Klingelhoets
State soil scientist, SCS, Madison, Wis.

More people responsible for land use planning are picking up soil survey maps since Wisconsin's Water Resource Act was adopted in 1965. It requires all counties in the State to lay down rules for the protection of all shorelands in unincorporated areas.

Detailed soil surveys help local units of government—villages, cities, and counties—to set forth flood-plain zoning, required by the act, where appreciable damage may occur.

"Shorelands"—according to the act—is land within 1,000 feet of a lake, pond, or flowage and generally within 300 feet of a stream.

A starting point

The soil map does not offer all the answers needed, but it serves as an effective base map. It also provides basic information about the soil and its behavior in various uses.

Alluvial soils in floodways of flood plains can be marked readily on the soil map. In some instances the outer boundary of the 100-year frequency flood is essentially the same for flood plain and floodway. When this is not true, topographic maps, experience flood maps, high watermarks, and local knowledge can fill in.

In some counties the soil map is a part of the official document the zoning ordinances are based on.

The country board of supervisors of Buffalo County was the first to use the detailed soil survey as a base map in its 1965 zoning ordinance. This was before the adoption of the 1965 Wisconsin Water Resources Act.

Since that time most of the counties in Wisconsin with completed soil surveys have used the soil maps as base maps for their ordinances. In each case, dollars are saved in procurement of suitable base maps.

The high water table at this basement excavation must be overcome through added expense for construction design or avoided by zoning for other development. Soil maps interpreted to show hazards of high water table or flooding, such as the examples above, help avoid such problems.

Additional savings in time and cost of delineating flood plains could easily exceed $5,000 per county where a soil map is available.

The local officials are using the maps to help designate areas for farming, parks, airports, golf courses, wildlife and nature preserves, game farms, picnic grounds, hunting, fishing, and hiking. They are finding the maps useful in determining where the filling, dredging, lagooning, and grading of land may be done, and where the cutting of shoreline vegetation should be permitted.

The maps, too, are helpful in determining the size, shape, and placement of lots for buildings, and the use, size, and type of structure.

Two basic ordinances

The county boards responsible for shoreline protection regulations are finding they need two basic ordinances. One applies to land use; the other is concerned with sanitation. Several counties are considering countywide application of sanitary and land use zoning ordinances based, in large measure, on detailed soil survey maps.

Where the soil survey is the base map used for countywide sanitary and land use zoning, the savings to the local people are great. Southeastern Wisconsin Regional Planning Commission once estimated that the soil inventory for a seven county area could result in $300,000,000 savings to the local people just in locating homes on suitable sites where sewage disposal systems would function properly.

The Wisconsin University Extension Service, in cooperation with the State Department of Natural Resources, is providing help to local citizens in using soil information in zoning. The Soil Conservation Service, in its work through soil and water conservation districts, is helping to interpret and apply the soil survey information. ♦

Conservation newsletter for teachers sparks interest in Indiana district activities

By Robert L. Eddleman
Work unit conservationist, SCS, Terre Haute, Ind.

A newsletter published for teachers by the Vigo County Soil and Water Conservation District in Indiana has helped put conservation in the classrooms of the Vigo County School Corporation.

Peter Farmer, member of the school board and former district supervisor, recognized the enthusiasm among teachers and administrators for a newsletter and soon the *Conservation Education News* was started in November 1966.

The *News* is a one-page mimeographed newsletter with ideas and hints teachers can use in the classroom. A typical issue has four or five short articles that might describe demonstrations the teacher or students can perform to clarify a lesson, or tell of a new reference source or publication. Dramatic problems such as water pollution, littering, and desecration of public areas receive special attention.

Soil Conservation Service personnel assist the district board in developing material for the newsletter. Editing and reproduction are done by the district's office secretary. Distribution to more than 200 elementary school teachers is made by the Vigo County School Corporation through its mail system, thus eliminating postage and addressing costs to the district.

Since publication began, the district reports an increase in resource-related activities in the schools. Teachers and students now come by more frequently to obtain reference materials or to ask for help in teaching conservation. School Corporation Superintendent Dr. George Huys recently said, "Most teachers feel a responsibility to teach conservation to their students, but many of them have only the broad, general facts in our textbooks. The newsletter and other helps from the district increase their effectiveness by offering specific projects and local information."

As a result of this increased interest the district is now making plans to participate in the annual Business-Industry Education Day sponsored by the Terre Haute Area Chamber of Commerce. During BIE Day teachers visit an industry or business and take information on its operation back to their students.

The district will conduct a visit to a local small watershed project to show about 35 to 40 teachers resource conservation in action.

Interest created by the newsletter is partially responsible for a cooperative agreement signed by the school corporation and the district. The district will provide technical assistance to the schools in planning needed conservation practices on school lands which in turn will serve as outdoor conservation laboratories. ♦

Conservation districts merge for broadened action

Two Utah soil conservation districts in operation for nearly 30 years have consolidated for more effective conservation action.

The new Canyonlands Soil Conservation District was formed by the recent merger of the Paria River and Escalante River soil conservation districts.

The area includes Bryce Canyon National Park and the Dixie National Forest. More than 98 percent of the District is publicly owned land. The many streams running through the district drain into the Colorado River above Grand Canyon. ♦

Soil conservation goes to town

Virginia district takes program to suburban area

By Stuart Finley

Chairman, board of supervisors, Northern Virginia Soil and Water Conservation District, Fairfax, Va.

Modern soil and water conservation has gone to town where most of the people are.

It concerns their land, trees and grass, and the streams that wind through suburbia.

It deals with eroding soil, fouling sediment, choked septic tanks, and with the many associated problems generated by the sometimes too rapid change from rural to urban uses of the land.

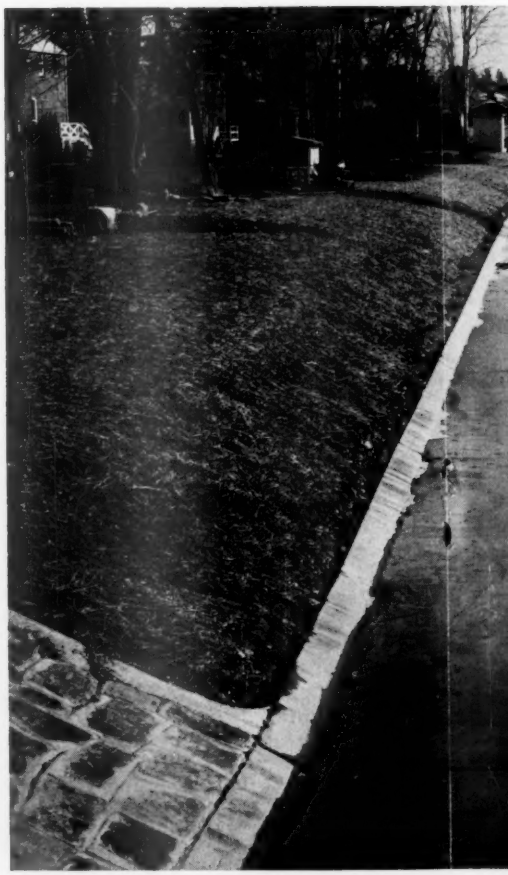
One of the problem-burdened areas of swift transition includes the Virginia counties across the Potomac River from the Nation's capital. These now densely peopled counties—Loudoun, Fairfax, and Prince William—are united in their fight to bring order and planning to bear on their resource problems in the Northern Virginia Soil and Water Conservation District.

Fairfax is one of America's most rapidly growing counties, population-wise. The two other counties are feeling the shock waves of change, but for the most part there remains time and opportunity for guided development and prevention of injury.

Citizens and officials of Fairfax County asked for help from their conservation district, organized in 1945 primarily to assist farmers with their conservation problems.

In response to the emerging land use crisis, the district and the Soil Conservation Service established a work unit to deal specifically with suburban problems. Meantime,

HYDROSEEDING. New specialized equipment that sprays a mixture of seed, fertilizer, and mulching material makes it possible to stabilize difficult cut and fill slopes quickly.



STORM DRAINAGE. A permanent storm drainage system should be a part of every building plan. In this one, a fixed liner and masonry outlet establishes a permanent grade for the ditch.

DEBRIS BASINS. Basins at strategic low points on a building site trap erosional debris during construction. Sediment may be redistributed and the basin obliterated when the work is done, or the basins may be made a part of the permanent water-control system.

Conservation practices for urban sites

Builders are finding practical ways to reduce erosion on construction sites during installation and to stabilize them when the work is completed. Here are some of the practices that have been used with success in the Northern Virginia Soil and Water Conservation District.

JUTE NETTING. Fibrous mulches, such as this jute netting, give temporary protection to bare construction sites and slopes. On other critical areas, short-lived grasses can be seeded following rough grading.

STRAW MULCH. Small-grain straw or hay also can be used as a mulch on exposed sites. Here the mulch is anchored by boards set as baffles across the slope to spread runoff water and give further protection.

Loudoun and Prince William counties each continued to have its own work unit devoted primarily to agricultural practices.

The Northern Virginia District has no regulatory powers. It makes consultive and technical services available to individual citizens, departments of the county government, other government agencies, and private organizations.

County takes responsibility

The heart of the suburban conservation program is the County of Fairfax itself. Its government agencies provide leadership, determine policy, and operate from day to day in many ways. The district deals primarily with the county board of supervisors, the county planning commission, the planning department, and the department of public works. Other important services are provided for the Fairfax County school system, the Fairfax County Park Authority, the Northern Virginia Regional Park Authority, and the Virginia Department of Highways.

The Northern Virginia Builders Association and the Homebuilders Association of Northern Virginia support the district's efforts to prevent erosion and sedimentation. Particularly useful are technical reports which are published from the homebuilder's own point of view and carry details of how to apply conservation during the development process.

Citizen action

Popular support for suburban conservation comes from county citizens. For instance, the League of Women Voters developed a slide show and supplied speakers for civic groups on the subject of urban erosion and sedimentation. The Northern Virginia Conservation Council provides a forum for citizen reaction. This group has worked to preserve green space, acquire parkland, and develop sensible guidelines for urban development within the county. Several watershed committees and similar resource oriented organizations also participate in this effort.

Here are some of the urban conservation problems the district and cooperating interests deal with: (1) Soil erosion, (2) sedimentation of lakes and streams, (3) flooding and flood-plain control, (4) land slippage, (5) stream and lake management, (6) green space and parkland acquisition, (7) wildlife habitat preservation and improvement, and (8) public information and technical guidance about all phases of resource conservation and development.

The fundamental problem of preventing erosion, sedimentation, and flooding centers around the development process. Most erosion in urban areas occurs during the construction of homes, shopping centers, schools, highways, and other facilities. Thus, the solution to the problem is to convince builders and developers, and the planners and designers who work for them, to adopt proper procedures. This is done by direct contact or through the Fairfax County official mechanism.

Information program

An effective information program which includes technical data and criteria is more constructive than simple coercion. But, providing information materials, evaluating projects, and conducting training programs must be a continuing effort.

As Fairfax County has developed in a few decades from rolling farmland to a suburban community with a population of more than 400,000, certain procedures, techniques, and facilities have been developed:

(1) Fairfax County employs a fulltime soil scientist. A soil survey has been made of all undeveloped areas of the county.

(2) Fairfax County has gradually developed a system of subdivision design regulations. The department of public works uses these criteria to prevent problems which would be caused through inadequate or improper design. The "Gray Book" outlines these criteria and ties them into the County Code. This book was written and is periodically reviewed by the Continuing Review Committee, a volunteer group of local engineers.

(3) Fairfax County has a strict set of regulations which prohibit flood-plain development or intrusion. Difficulties resulting from earlier flood-plain development are gradually being corrected.

(4) Fairfax County has passed an erosion and sedimentation ordinance. It sets the standards, and it controls the occasional irresponsible operator. Its language is brief, and the technique has been to tie certain important controls directly into the County Code by adding scope to existing regulations.

(5) The Northern Virginia Soil and Water Conservation District is now completing comprehensive watershed evaluations for all 30 of the county's stream valleys.

(6) The SCS soil conservationist provides consultive and technical services to county departments, other public agencies, private organizations, and individuals. These services range from designing temporary silt basins for developers to advising a homeowner on how to correct an eroding ditch on his property.

(7) Fairfax County and the Northern Virginia District are cosponsors of a flood-prevention project in the Pohick Creek watershed.

Within this total framework, then, Fairfax County has the authority and responsibility to guide and regulate; the Northern Virginia District assists all parties; the builder and developer have the responsibility to follow criteria and adhere to the ordinance; and the general public should show sufficient interest to provide motivation for these various conservation efforts. ◆

Yakima Indians ban gravel pits near roads and make recreation areas of old ones

White Americans can learn a lesson or two about conservation from the Yakima Tribal Nation in south central Washington State.

With an eye for beauty, utility, and tourists, the Confederated Tribes and Bands of the Yakimas has banned gravel pits near well-traveled roadways and has developed fishing ponds on existing pits.

In a time of rapidly expanding highway and road systems, demand for gravel is growing also. This gravel traditionally comes from surface mining, which results in many unsightly holes in the ground.

It's only natural that road builders should try to get their gravel as near as possible to where they are building. Roads mean tourists, and tourists mean money these days. Gravel pits don't make for nice scenery alongside a new or rebuilt highway.

Quarter-mile setback

From now on, tribal leaders have decided, additional gravel pits will not be authorized on Indian-owned lands within a quarter mile of a well-traveled roadway.

The Yakimas control about two-thirds of the 1.2 million acres of land in Toppenish Soil and Water Conservation District. About a thousand miles of roads would be subject to surface-mining policies.

On the positive side, the Yakimas are moving to make existing pits useful and attractive. For example, they have converted a 4-acre pit west of Toppenish into a fish pond for youngsters up to 14 years old. In addition, they have developed plans for a park and picnic area on adjacent land. The pond has been stocked annually with trout since 1955, but in the fall of 1967, tribal officials changed to bluegills and bass on recommendation of the U. S. Bureau of Sport Fisheries and Wildlife.

The pond today is a mecca for children of all races. Water from underground seepage is enough to maintain fish year 'round. If needed, additional water can be obtained from a nearby canal system. Any local youngster can direct a stranger to "Charlie's Pond," as the fishing spot is known.

The Yakima Tribe also has converted another 2-acre gravel pit into a fish pond for children.

Beside keeping gravel pits away from highways, the Yakimas now require slopes of stipulated grade. In some instances, bared slopes must be planted.

Example for landowners

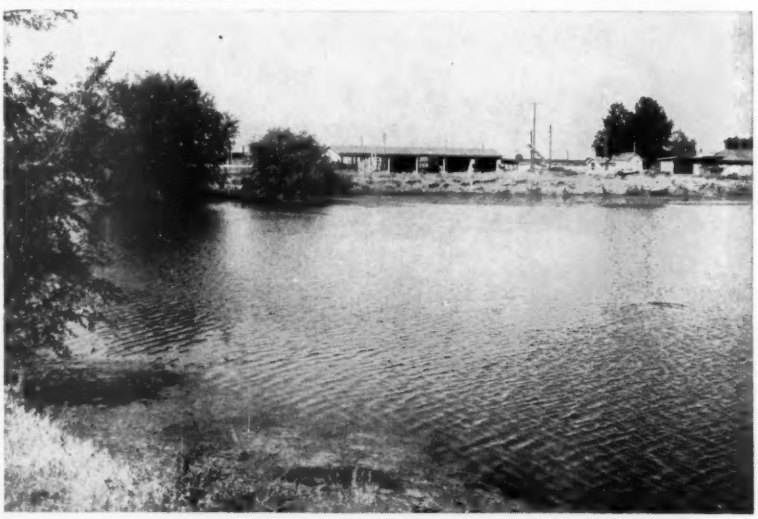
Toppenish Soil and Water Conservation District is urging other landowners and operators in the district to follow the examples of the Yakimas—and with some success. A number of gravel pits have been refilled during land leveling and covered with topsoil. Some landowners have developed fish ponds. Some pits serve as waste water disposal systems for irrigated land. In areas of high water table, some farmers and ranchers pump water from pits for irrigation.

Around Toppenish, there are some 170,000 acres of irrigated land. About a fourth of this has the type of soil, underlain by gravel readily available and close to existing roadways, that is attractive to contractors. Result: some 250 known gravel pits in the district, varying from a tenth of an acre to 10 acres in size and averaging 8 feet deep. In an area equivalent to a township, an aerial photograph of some years ago indicated 36 gravel pits containing water. Most pits contain water during irrigation season; some, the year around.

Stagnant water is a natural habitat for mosquitoes. Weeds and other evidence of neglect make for unpleasant scenery. With beautification so important to all Americans, both for tourists and residents, it behooves us to attend to the scenery alongside our roads.

This is a philosophy that has become policy on land controlled by the Yakima Indian Nation.—DONALD N. DAVISON, *work unit conservationist, SCS, Toppenish, Wash.* ◆

Charlie's Pond, formerly a 4-acre gravel pit, on Yakima tribal land is a mecca for children of all races.



A 40-acre citrus grove near Mission, Tex., (above) is prepared for level irrigation by machines working between the trees. In a double-set orchard after between-the-tree land leveling (below) the older trees benefit from more efficient irrigation while the young trees grow to maturity.

An easier way to irrigate

Citrus growers take advantage of frost kill to level land between trees in old orchard

Don't sell the fellow short when he stops, wipes the sweat from his brow, lays down his irrigation shovel in disgust and says, "There must be an easier way!" That can be the birth of progress—the progress of more efficient irrigation systems.

That's how between-the-tree land leveling started.

A large percentage of the citrus trees in the Lower Rio Grande Valley of Texas was planted before 1950, which was about the time land leveling was becoming a popular conservation practice. For this reason, much of the old citrus plantings are on unlevel land.

Then in January 1962, the valley

Pruning after a frost kill makes room for land-leveling machines to work between the rows in an old orchard.

had one of the most damaging freezes on record. It killed many citrus trees. The ones that survived had to be pruned back.

In the spring of 1963, the boards of supervisors of the Southmost and Willacy-Hidalgo soil and water conservation districts decided that it was time to do something about inefficient irrigation systems on orchards planted on unlevel land. Since the tree canopies had been pruned back, land-leveling equipment could work between the trees and could reshape the surface of existing orchards.

Soil Conservation Service irrigation engineers helped develop criteria for leveling orchards. Standards are much the same as for open land. The cut and fill depths are limited to avoid excessive damage to the trees.

Leveling permits a close-spaced tree setting or double-setting existing trees, because on level land irrigation borders need be constructed in only one direction, not at right angles to one another as on unleveled land.

The cost of leveling groves varies according to the amount of earth moved and the difficulty of moving it. The average cost is about $40 an acre.

Since 1963, more than 6,000 acres of existing citrus orchards have been leveled in the two conservation districts. This is about one-fourth of the acreage needing leveling. This work has been done at a cost of about a quarter of a million dollars.

Water and irrigation labor requirements average one-third less on leveled land. This saving, plus increased citrus yields, usually offsets the cost of leveling in less than 2 years.—HAROLD C. CAMPBELL, *soil conservationist, SCS, Mission, Tex.* ♦

Wind erosion at low level in the Great Plains

Land damaged by wind erosion in the Great Plains in 1967-68 decreased by 1,253,960 acres or 51.5 percent from the previous year, SCS's final summary of wind-erosion conditions for the season ending May 31 shows.

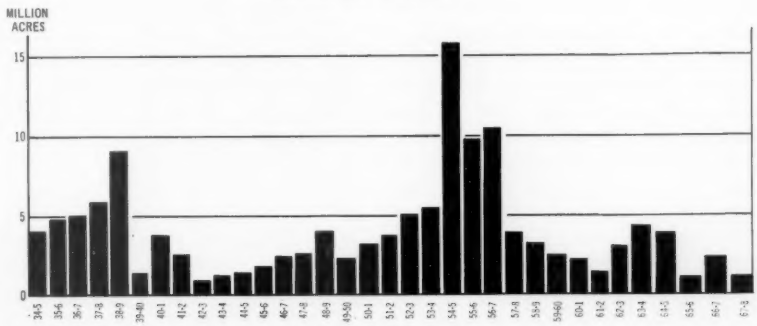
Some 1,178,933 acres was damaged in 211 counties compared to 2,432,893 acres in 202 counties a year ago. Of the total land damaged, 94.7 percent was cropland (1,116,020 acres), 2.9 percent rangeland, (34,160 acres), and 2.4 percent other land (acres).

The Southern Plains states reported 463,613 acres (39.3 percent) and the Northern Plains states reported 715,320 acres (60.7 percent) damaged.

North Dakota with 445,000 acres and Texas with 311,290 acres sustained 64.2 percent of the damage. ♦

ACRES OF LAND DAMAGED ANNUALLY IN GREAT PLAINS

Seasons 1934–35 to 1967–68, inclusive



Farmer sweetens that lemon acre with hybrid Coastal bermudagrass

Frank Dawson, a farmer near Vanceboro, N. C., knows the value of the old saying, "When you get a lemon make lemonade out of it." He owns a small farm on the River Road where Mother Nature dumped huge piles of sand during the past centuries.

Mr. Dawson is not the type of person to just sit and watch and wait. He tried to use this piece of land in every way possible. Realizing that he was getting nowhere fast, he made application to the Lower Neuse Soil and Water Conservation District. A soil map was prepared and a conservation plan was developed.

His farming operation succeeded, except for this one "lemon" of about an acre in size that defied all treatment given to it. It simply was a dead spot of sand that produced only dust for his living room table every time the wind blew.

Frank once said, in discussing his farm plan, "I'll be honest with you, I've tried everything and then some, and I really don't want to waste any more money on that piece of sand."

But after considering a few of the plants that SCS had put into use in recent years, he did agree to try hybrid Coastal bermudagrass. It so happened that he had helped his neighbor across the road plant some on soil that was very similar, so he took home a few sprigs and planted them. To his amazement they lived, and by the end of the summer they had made remarkable growth. Frank still was not convinced that this grass was going to live on the sand hill, so he waited another year.

Then, with additional information and observation, Frank prepared a seedbed and planted the field to the grass. Since this was "give it a one-more-try idea," he carried out recommendations to the best of his ability. By the end of the summer, he was convinced that the grass had merit. It even gave him a little grazing for his milk cow.

Frank Dawson views the harvest from his 7 acres of Coastal bermudagrass. The hay was cut after the four yearlings and a cow grazed all summer on the area.

The next summer Frank bought three calves and a heifer in addition to his old milk cow, and they had all they could eat. In fact, a stack of hay was harvested in the late fall from the surplus growth.

Then came a dry year and the corn crop was extremely short. But the dry weather did not hurt the bermudagrass and this made that project look even better.

Frank can now show anyone who is not a total believer in Coastal bermudagrass how he traded "dust" for "beef steak" on his living room table, and you can't argue with that kind of success.—O. R. HECHT, *work unit conservationist, SCS, New Bern, N. C.* ◆

Tree planting featured in Algerian projects

Tree planting was the main activity in several soil conservation projects intended to provide work for unskilled laborers in Algeria under a technical aid agreement between the United States and the Algerian Government.

As project conservationist at Al Asnam, I helped with the technical supervision of the work. The United States provided the tools and part of the pay for the workers in the form of wheat and vegetable oils. The Algerian Government supplied the rest of the pay.

Workers prepared a planting site for each tree by leveling an area 3 to 4 feet across, graded slightly against the slope to hold some water. Planting stock, mostly in pots, came from two project nurseries and several older Algerian nurseries. Where livestock were kept out, survival was good.

Eucalyptus and aleppo pine were the main trees planted. Cypress, cork oak, and cedars were also planted on selected sites. Olives, almonds, figs, and carobs were planted, to the extent stock was available, for fruit and nut production. Large acreages in the

mountains were better suited for grass but shortage of adapted seed and the fact that hand labor was not suitable for planting grass greatly limited this practice.

Most projects were in mountainous areas where the land was steep and eroded and unemployment and poverty were the greatest. There was no problem of securing authority to work on private or public land. Government officials and private landowners were aware of the need for erosion-control measures, and workers were friendly and willing to cooperate. At the peak period, more than 10,000 Algerians were employed.—T. D. DICKENS, *area conservationist, SCS, Hays, Kan.* ◆

Music student works at conservation for district

What does the scheduling of grass seed drills have to do with a university student studying music?

George Davis can see the connection clearly because he is studying music, and he is spending the summer working for the South Caddo Soil and Water Conservation District at Anadarko, Okla.

Mr. Davis, a 22-year-old Negro, is a music student at Oklahoma State University. He is employed to gain work experience by the Office of Economic Opportunity on the Operation Mainstream Project. Davis works for the South Caddo District and receives supervision from the Soil Conservation Service.

His job is assisting in the management of the grass seed drills owned by the district.

"The sale of grass seed and the rental of equipment to district cooperators is a sizable project for the South Caddo District," Davis says. "I schedule the equipment located at Anadarko, and I have my hands full." Other district equipment is located at nearby Fort Cobb.

Up to now Davis has helped nearly 100 district cooperators purchase and plant 24,000 pounds of weeping lovegrass seed.

M. A. Caruso, chairman of the board of supervisors of the district, thinks highly of Davis' work. "Davis' efficiency and pleasing personality have made him a success with local farmers," he says.

Davis isn't wasting any time while he's away from school. Besides being choir director for the Morning Star Baptist Church, he plays piano, presents vocal solos, and directs a singing group.—A. P. OTTINGER, *work unit conservationist, SCS, Anadarko, Okla.* ◆

Mulch planting permits double cropping

Mississippi farmers near Hattiesburg are using wheat and soybeans in a mulch-planting system that conserves both soil and water.

In this system the soybeans are planted with a mulch planter following the wheat harvest. No land preparation is necessary, little time is lost between the two crops, and the ground has a continuous protective cover.

With technical assistance from the Soil Conservation Service, soil conservation district commissioners in the area have sponsored a number of field demonstrations to show farmers the techniques of mulch planting and harvesting.

Cooperator Earl Hartfield examines wheat on his farm in the Forrest County Soil Conservation District.

One Forrest County District cooperator, Jim Bob Walters of Sunrise, used the double cropping system to grow wheat following soybeans and produced 27 bushels of wheat an acre. He now believes he can raise the wheat yield and winter his beef herd on the wheat also.

Results are proving that the wheat-soybean combination fits well into both large and small operations in south Mississippi.

P. T. Eubanks, Sumrall, vice president of the Mississippi Association of Soil and Water Conservation District Commissioners, grew wheat and soybeans on 200 acres with an average of 35 bushels of wheat an acre.

"Wheat never stops growing due to cold weather," says Mr. Eubanks. "It is one of the best grazing crops we can grow during winter months. Cattle grazing it will gain more than a pound a day over a 2½-month grazing period."

Yance Carter, Moselle, who farms 87 acres, using wheat as a double crop with soybeans on 40 acres, is also enthusiastic about the system.

Agricultural groups have cooperated in helping the farmers find markets and produce high-quality wheat.

The Forrest County Farmers Cooperative, managed by James Tatum, set up marketing facilities for the Hattiesburg trade area.

The Soil Conservation Service assisted with many field demonstrations and is helping south Mississippi farmer-cooperators apply conservation plans that include mulch-planted soybeans following wheat. —W. B. GARY, *work unit conservationist, SCS, Hattiesburg, Miss.* ◆

Meetings . . .

Water federation to discuss waste disposal

The Water Pollution Control Federation holds its 41st annual conference in Chicago, Ill., September 22-27 with concurrent sessions for presentation of technical papers.

Subjects include federal-state relationships, industrial waste disposal, water quality in the Great Lakes, water-resources planning, and research on everything from algae to prevention of oil spills.

Papers on topics of special interest to agriculture will include: Lagoon treatment of kraft paper mill effluent, potato processing wastes and byproduct feed recovery, treating poultry plant wastes, disposal of digested sludge on cropland, combined treatment of sewage and sugar beet wastes, a new biological process for treating dairy waste, and tannery waste treatment.

Forestry and human environment discussed by American foresters

The 68th Annual Meeting of the Society of American Foresters will be held in Philadelphia, Pa., September 29-October 3, 1968. The 1968 theme is "Forestry and the Human Environment."

The Divisions of Education, Economics and Policy, Forest Management, Forest Recreation, Forest-Wildlife Management, and Watershed Management will hear the theme discussed in their separate programs.

Dates and places

September 3–7, American Institute of Biological Science, Columbus, Ohio

11–13, International Association of Game, Fish and Conservation Commissioners, Tucson, Ariz.

22–27, National Conference on State Parks, Hot Springs, Ark.

22–27, Water Pollution Control Federation, Chicago, Ill.

23–27, Urban Land Institute, Denver, Colo.

28–Oct. 3, American Institute of Planners, Pittsburgh, Pa.

29–Oct. 2, Farm and Industrial Equipment Institute, Atlanta, Ga.

29–Oct. 2, American Bankers Association, Chicago, Ill.

29–Oct. 4, American Society of Civil Engineers, Philadelphia, Pa.

30–Oct. 3, Society of American Foresters, Philadelphia, Pa.

October

6–9, American Chamber of Commerce Executives, Portland, Oreg.

7–10, American Mining Congress, Las Vegas, Nev.

7–10, National Association of State Foresters, New Orleans, La.

12–17, Congress for Recreation and Parks, Seattle, Wash.

13–17, American Park and Recreation Society, Seattle, Wash.

13–17, National Recreation and Park Association, Seattle, Wash.

13–16, American Forestry Association, Portsmouth, N. H.

23–27, Association of Engineering Geologists, Seattle, Wash.

27–31, American Forest Products Industries, Washington, D. C.

27–Nov. 1, National Association of Travel Organizations, Las Vegas, Nev.

31–Nov. 3, Sprinkler Irrigation Association, Coronado, Calif.

Youth projects interest students in conservation

The dropout rate is low among Bay County school children who volunteer for youth conservation projects sponsored by the Bay County Soil and Water Conservation District in Florida.

Joe T. Saunders, SCS conservationist for the district, started the program 9 years ago with a minimum budget but plenty of enthusiasm from the district board of supervisors and school officials.

The program is planned for schools where the most interest is noted during the preplanning sessions for school teachers.

For the third graders, Saunders prescribes only posters and scrapbooks designed to create an interest in conservation.

For the older groups, the projects become increasingly difficult. One of the teams has taken on the beautification of a large industrial park in Panama City.

In the sixth grade, each student is offered a variety of projects. Saunders says that 95 percent of the students in a class who volunteer for the program will complete the course. Each class that is selected to participate is called a club. Students select their own officers, choose their own project (which is usually on the school grounds), and set up their personal projects.

The youngsters have sold cookies and washed cars to raise money to buy shrubbery, which they plant on Saturdays when school is out and Saunders has the day off.

The 1966 National Youth Conservation Award Winner, Miss Linda Voss, was one of the first youngsters to get interested in the program, Joe points out. It has also paid off for 96 children who earned their way to summer camp last year.

"The program is an effective aid to our school system and provides the children with knowledge and experience not available elsewhere," said Assistant School Superintendent Marvin McCain. ♦

Judges examine a partridge pea planting, an entry in the Boy Scout soil conservation contest near Panama City, Fla.

Review

Soil Dynamics in Tillage and Traction. By William R. Gill and Gene E. Vanden Berg. *1968 USDA Agr. Hbk. 316. 511 pp., illus.; paper. $1.75.*

This handbook conveys both definitive and practical information concerning soil dynamics to persons interested in tillage and traction.

Where possible, mathematical treatment has been developed in quantitative terms to express specific soil-machine relations on the assumption that these relations must obey fundamental laws.

Basic forms of soil behavior, such as shear failure and sliding friction, have been identified and quantitatively described by behavior equations.—R. C. Barnes, *agricultural engineer, SCS, Washington, D. C.*

Irrigation of Agricultural Land. Edited by Robert M. Hagan, Howard R. Haise, and Talcott W. Edminster. *1967. American Society of Agronomy, Madison, Wis. Agron. Monogr. 11. 1,180 pp., illus. $22.50.*

This is one of the best books on irrigation to be published in recent years. The book is pointed primarily at the soil, water, and plant aspects of irrigation with some attention to planning. Construction, maintenance, and economics are not specifically treated.

The editors have done a competent job of organizing a multitude of subjects written by numerous authors without letting the book become a hodge podge of general information. There is a minimum of overlap between the chapters.

The list of authors, of which there are 120, reads like the who's who of irrigation in the United States, with several foreign countries also represented.

Numerous literature citations provide a very useful up-to-date bibliography for the student of irrigation agriculture.

This book provides a badly needed single, unified reference work on irrigation that reflects the latest thinking by a carefully selected group of well-qualified authors.—T. H. Quackenbush, *irrigation engineer, SCS, Washington, D. C.*

Introduction to Flood Proofing. By John R. Shaeffer. *1967. Center for Urban Studies, University of Chicago. 60 pp., illus. (No price indicated).*

Introduction to Flood Proofing was prepared as part of a study of certain aspects of flood-plain management conducted by the Center of Urban Studies for the U. S. Corps of Engineers and the Tennessee Valley Authority.

It presents information and guidance on techniques for preventing flood damage to structures and contents of buildings in a flood-hazard area.

A number of simple but effective measures for reducing flood damage are described and illustrated. The uses and limitations of each are clearly set forth. The structural engineering aspects of programs for flood proofing are presented with a generous use of sketches and photographs.

So far as we know, this is the first general treatment of the subject made available to the public. It will be received with gratitude by people responsible for the care of buildings in the many flood-hazard areas of the country.—H. C. Enderlin, *assistant director, Engineering Division, SCS.*

Converting Land From Rural to Urban Uses. By A. Allan Schmid. *1968. Resources for the Future, Washington, D. C. (distributed by Johns Hopkins Press, Baltimore). 103 pp. $4.*

In a tentative treatment of a subject that calls ever more urgently for positive analysis, this report of one of Resources for the Future's land use studies addresses itself mainly to two aspects of the problem: (1) Land prices and costs of urbanization, and (2) needs for further research.

The results are interesting and significant, but they fall far short of the promise of the title. The reader will find no consideration of physical and biological resources involved nor of the social and economic forces so important in the conversion of land from rural to urban uses.

Emphasizing the inadequacy of existing data, the author presents statistical tables indicating that, in general, land price increases on the order of 1,000 percent (with wide variation, of course) from the time the land is used for farming until it is offered as a developed urban building site.—B.O.

Soil Acidity and Liming. Edited by Robert W. Pearson and Fred Adams. *1967. Amer. Soc. Agron., Madison, Wis. Agron. Mongr. 12. 274 pp., illus. $7.50.*

This monograph is one of a series started by the American Society of Agronomy in 1949. It is a comprehensive review of the various aspects of soil acidity, including the actions of minor elements associated with acid soil.

Thirteen authors contributed to the seven chapters, four of which deal with research on soil acidity and liming in four major agricultural areas of the country. Each chapter includes the list of references used in compiling a thorough treatment of each phase of soil acidity.

Considerable information is included on the major soil series in the four agricultural areas, as well as the need and response of many crops to liming practices.

Soil scientists and others interested in soil productivity will find this monograph valuable as a reference and aid in explaining crop responses to lime.—B. D. Blakely, *head agronomist, SCS.*

Conservation for Camp Counselors. By Reynold and Ruth C. Carlson. *1967. American Camping Association, Bradford Woods, Martinsville, Ind. 74 pp., illus. $2.00.*

One of the better efforts in presenting a conservation emphasis in camping is this small but fact-filled booklet which at long last puts into better perspective the potential for teaching *conservation* rather than mere tree identification on a campsite.

Designed for the counselor working with youngsters in an organized camp, the emphasis throughout is on giving the camper a well-rounded view of natural resources and his relationship to the natural world.

The booklet is based in part on *Conservation in Camping,* which was published 15 years ago as a cooperative project of the Soil Conservation Service and the American Camping Association. Now updated, with a very practical and useful list of recommended publications at the back of the book, it should be in the hands of every camp counselor before he begins a season at an organized camp of any kind.—Katharine C. Mergen, *Information Division, SCS, Washington, D. C.*

New publications

Conservation of Natural Resources. *1967. Boy Scouts of America, New Brunswick, N. J. 80 pp., illus. $0.35.* A completely new manual in the merit badge series of the Boy Scouts, this booklet contains much practical information needed by a Scout to earn the conservation of natural resources merit badge, which is now required for Eagle rank. This new merit badge does not replace any others. Among other topics the manual deals in a broad way with the relationships among natural resources, water pollution, community water supply, air pollution, conservation laws, natural resource management, resource agencies and organizations, and resources of the sea.

Multiple-Purpose Watershed Projects Under Public Law 566. By Watershed Planning Division, SCS. *Rev. 1968. USDA PA-575. 13 pp.* Facts about multiple-purpose watershed projects—how they get started; how they are constructed, financed, operated, and maintained; what the Federal Government does; and what the local people do. This bulletin supersedes PA-392 on the same subject.

Films. By Motion Picture Service, USDA. *Rev. 1968. USDA Agr. Hbk. 14. 81 pp. $0.40.* An alphabetical listing by titles, with brief descriptive notes, of more than 300 motion picture films available from the U. S. Department of Agriculture. In the index by subjects, 22 titles are shown under "erosion control," 38 under "soils and soil conservation," and 34 under "water and water conservation." There is considerable duplication.

Community Action for Natural Beauty. *1968. Citizens' Advisory Committee on Recreation and Natural Beauty, Washington, D. C. 36 pp. $0.40.* A "guide for citizens who want to participate in practical action to make their communities better places to live in."

Efforts to mobilize people to enhance natural beauty have been especially difficult because the goal itself, beauty, is an intangible not easily defined.

This simple handbook provides practical suggestions on how to get started by reviewing (1) the public and private organizations that could participate and the attitudes of their officers, (2) the physical conditions and problems, (3) the laws and regulations affecting quality of the environment. It suggests sources of public aid, a variety of projects and activities, and some useful publications. The potential roles of soil conservation districts and small watershed projects are recognized.

Soil surveys

Pierce County, Wisconsin. By Orville L. Haszel. *1968. 165 pp., illus.; with maps 4 inches to the mile (1:15,840).* Fieldwork by Dale E. Parker, Delbert D. Thomas, and Gordon N. Wing.

Pahranagat-Penoyer Areas, Nevada. By Lloyd Rooke, L. N. Langan, and D. G. Bagley. *1968. 121 pp., illus.; maps 1.875 inches to the mile (1:31,680).*

Sutton County, Texas. By C. C. Wiedenfeld and J. Dewayne McAndrew. *1968. 33 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Okmulgee County, Oklahoma. By W. A. Sparwasser, Vinson A. Bogard, and Odos G. Henson. *1968. 51 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

AMERICA THE BEAUTIFUL COLOR LITHOGRAPHS

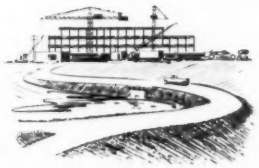
America The Beautiful—Utah USDA SOIL CONSERVATION SERVICE

SHEEP ON MANAGED MOUNTAIN RANGE, WASATCH SOIL CONSERVATION DISTRICT

Full-color lithograph prints suitable for framing—one for each state, Puerto Rico, and Virgin Islands—are available from the Superintendent of Documents for $0.10 each or $5 for set of 52. Obtain order blanks from your local SCS or post office.

From the Administrator:

Conservation for the total community



In recent years the Nation's soil and water conservation districts have been revising their operations to include increased assistance to urban and suburban communities faced with the need for planning for rapid but orderly growth.

At the same time hundreds of communities have become aware of the services available to them from the trained and skilled technicians of the Soil Conservation Service who work through the conservation districts.

This turn of events, quite natural when the background for them is taken into account, has required the Soil Conservation Service to alter in some degree its view and approach to its overall resource-conservation job.

The Nation's soil and water conservation districts already have at their disposal much information and experience of value to community and county planners. It is obvious that, working together, agencies of local government can accomplish far more than if they continued independently.

The legislation establishing the Soil Conservation Service stipulated that the work to be done by the new arm of the Federal Government would be for the benefit of all the people. Public Law 46 was not a farm bill. It was indeed a land bill, and the first aim of the new bureau was the control of erosion.

Since most of the land needing attention at that time was agricultural land in private ownership, it was natural that we should begin our work there. But it was never the intention of Congress that soil and water conservation be solely a farm program.

Therefore, in our progress toward a goal of conservation use of all our land, we provide nonfarm people also with the information they need for their own planning and development. Much of this information concerns water.

Water, we have pointed out from the beginning, first becomes available for management and use when it falls on land. If we are going to provide for its conservation and for the protection of its quality, there is where we must start.

Our engineers and other professional employees have been involved for more than three decades in helping soil and water conservation districts with problems concerning water. In the early years much of their work was in the design and building of farm ponds in places where they would be successful and most useful and terracing with grassed waterways for the conservation of soil and water and the reduction of sediment. Gully plugs and drop inlets helped with the job, and grass, shrubs, and trees fitted into the effort to repair damage and provide for conservation use of basic resources.

It was following the Flood Control Act of 1944 that the SCS became involved in the protection and development of watersheds on small streams and tributaries. Agricultural benefits were our main purpose, but seldom did we help with the planning of a project that did not have benefits for at least one urban community.

In this process we extended our usefulness as our skills became known and respected. We have helped scores of communities with problems involving the control and management of water, the creation of dependable supplies of acceptable quality, the creation of recreational facilities and the prevention of periodic flooding.

In this work we have gained a reputation as a source of competent professional assistance for those who need it—a reliable combination of the knowledge and skills of the engineer, the soil scientist, and the plant scientist with the talents of the hydrologist, the geologist, the biologist, and the economist in full support.

All of what we do is based on the simple and inescapable premise that soils differ, that water has to be handled according to certain principles, that the technologies relating to soil, water, and plants must fit together, and—this is most important—whatever is accomplished in the conservation use of our Nation's resources must be done by people.

People are the key. We in the Soil Conservation Service do not do soil and water conservation. We work with the millions of landowners of America who are interested enough to develop conservation plans and, in cooperating with their soil and water conservation districts, to use the knowhow and skill of SCS technicians and others in getting the needed work done.

The problems associated with the changing of agricultural land to homesites, roadways, school grounds, and other community uses are many and complex, but the basic principles of conservation are the same as anywhere else.

We have been improving our technology in the whole field of soil and water conservation for a long time. Techniques are not so much a part of the problem as getting the techniques used. It must be our objective to help the communities of our Nation in their efforts to create the kind of environment they would have for themselves. We shall do this, as in our other work, through the soil and water conservation districts of the Nation.

If we set out to do less the result would be less than enough.

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They cooperated to remove road hazard and develop water supply

Take the need for stockwater, add a dangerous road bridge, and the growing desire for water recreation and you come up with an opportunity for community cooperation.

This is just what happened recently in the community of Edna in Labette County, Kans. The county Technical Action Panel encouraged a cooperative project to build a dam 40 feet high and 256 feet wide at the base to take the road across the stream and to hold back water for livestock.

The idea of cooperating on the project began in 1964 when the county commissioners determined that a county bridge southwest of Edna was unsafe.

At about the same time, Bill McKee and Nat Goodwin, stockmen living adjacent to the bridge, asked the Labette County Soil Conservation District for technical help in building a dam to supply stockwater to their farms. Soil Conservation Service technicians surveyed the site and realized that a dam built in conjunction with the county road could solve several problems.

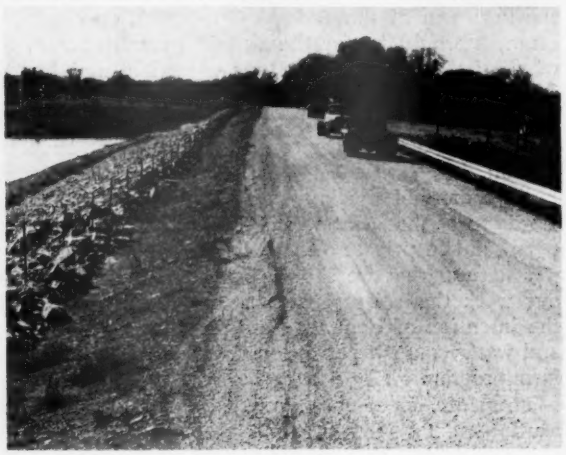
An agreement was reached with the county commissioners that the county would contribute $6,000 and materials to the project equal to the cost of replacing the bridge.

The Agricultural Stabilization and Conservation Service agreed to provide cost-sharing under a pooling agreement on the dam.

McKee, who lives below the damsite, agreed to provide land for the dam fill. He shared in the cost of pipe and fencing as well. He now receives an abundance of water by gravity through a 2-inch pipe. McKee plans to build a hog feedlot below the dam.

Goodwin plans to pump water from the 7.2-acre lake to his ranch headquarters. He has fenced the entire lake to keep livestock out. He and his son Tim plan to build a boat dock. Safety signs indicating steep slopes and deep water have already been put up. The lake has been stocked with fish.

Henry Weil gave easements to allow part of the dam to be built on his land.

This reservoir also serves as an emergency water supply for the community. Such an emergency occurred in 1964, when local farmers and ranchers had to haul livestock water as far as 15 miles.—L. JAMES GASKELL, *work unit conservationist, SCS, Altamont, Kans.* ♦

A dangerous and inadequate bridge (note fender left on bridge railing) was replaced by a wide, straight highway over a multipurpose dam.